

but this opinion of ours may possibly arise from the difficulty we have felt in fathoming his arguments. There is an originality of statement about them which often makes it impossible to decide hurriedly as to whether they are right or wrong. For example:—

“Electricity is not to be confounded with the electric spark—they are the direct opposites of each other. Electricity is a force of attraction which brings particles of matter into contact; the electric spark is the kinetic energy produced by the action of the electric force through the available distance, and has a dissipant effect upon the particles. By the conservation of energy the electric force ceases to act when the spark is produced. The potential is then converted into kinetic energy. This affords a conclusive reply to the theory, adopted by some eminent authorities, that electricity and light are identical. Light is a form of heat and has always a dissipant effect upon the particles of matter. It is therefore the direct opposite of electricity, which is a force of attraction.”

This is certainly not all wrong. The question is how much of it is right? To those readers who are attracted by the above extract we recommend the two hundred and thirty-seven pages of this volume.

(2) Just as in the work reviewed above the dependence of forces upon position is made the universal law, so here the essential identity of all forces is sought for in a kinetic view of matter.

All phenomena of attraction are explained, and can be reproduced by the simple rotation of a screw or turbine in water and in air. The turbine is presented as the universal motor which gives rise to molecular attractive forces and the phenomena which accompany them. The author claims to assume nothing besides the propulsive motions produced by rotations of molecular turbines, and congratulates himself on the rare good fortune that everyone can understand the effects of such rotation.

A number of experiments with ventilating fans are described; the author then wanders off into a comparison of a magnet with a living being, and a consideration of the position of man in the universe.

It is a commonplace to suppose that scepticism is the beginning of belief; the author's creed is accompanied by the usual doubt as to the validity of many of the conclusions of modern science. The value of his criticisms can be measured by his objections to the recognition of the essential identity of light and Hertzian waves. He disposes of the argument which rests on the identity of velocity of the two phenomena by saying that all waves produced in the ether, of whatever nature they may be, must, in fact, have the same velocity, since the velocity of a wave depends, not on its form, but only on the elasticity and density of the medium of transmission, which in this case is the ether.

We cannot look upon this book as a serious contribution to scientific literature, but we readily admit that there are analogies between the effects of the motions which the author describes and other physical phenomena; and if these were systematically described a very interesting volume could be made. But there is so much here that is merely fanciful that we must advise anyone who reads it to read it with caution.

NO. 1881, VOL. 73]

OUR BOOK SHELF.

A Descriptive Handbook of Architecture. By Martin A. Buckmaster. Pp. xvi+188. (London: George Routledge and Sons, Ltd., n.d.) Price 3s. 6d. net.

THIS is a little book which is intended to help those to whom architecture is a subject of ever-increasing interest. The author refers to a subject which Mr. Banister Fletcher has already brought forward prominently in the preface to “The History of Architecture” and in a paper read before the University Extension Guild, namely, the inclusion of the study of historical architecture in a liberal education. It certainly seems that, owing to the ease of travel, the use of photography and other causes, a knowledge of the elementary principles and forms of the various types of architecture might well be expounded to the senior forms of educational institutions, and this way of interesting the rising generation in matters which appertain to everyday life and observation would tend largely to increase interest in matters artistic and practical.

Concerning the book under notice, much cannot be expected for the low price at which it is published, and it would probably have been better had the author dealt with one period of architecture, and have done that thoroughly, rather than have taken up so large a field. It has resulted in an essay which is “scrappy,” and from which we are afraid the attentive student will gather very little of much use to him.

One or two points call for revision. Why is “mediæval” architecture made to *end* at 1090 when most people hold that it *commences* about that time?

Plate *iiia.* is merely an enlargement of part of plate *xviii.*, and might be omitted. Some of the illustrations are very poor; that on p. 20 would lead the student to believe that the Temple of Theseus and the Parthenon had suffered from an earthquake since we saw them last spring!

The ground range of the columns to the Colosseum is not Doric, dentils are wrongly spelt on pp. 25 and 27, and the Temple of Zeus, Athens, is given another name on p. 28. The giving of exact dates for each period, and the printing at the top of each page, are sure to mislead the student; for no style can be truly confined within a period of such exactitude as, say, 1377–1547, and the student should be warned against such an attempt.

The line illustrations are of an amateurish description, and plates *viii.* and *xi.* should be re-drawn.

Plate *xliv.* seems to be a copy of a plate in a well known history, though this is not acknowledged. The division of early Christian architecture into Roman and Byzantine is likely to confuse the student, as Roman is always considered historically as pagan architecture.

Proceedings of the London Mathematical Society. Vol. *ii.* Pp. xx+490. (London: Francis Hodgson, 1905.)

THE present volume of *Proceedings*, though the size of the page has been changed, and larger type is used, contains about the same amount of subject-matter as its predecessors. It affords evidence that the publication of researches in higher mathematics still receives the same care and attention which it has for many years past obtained at the hands of the small body of workers who mostly travel up on Thursdays by the 2.15 train from Cambridge to attend the meetings in Albemarle Street with their friends. It contains interesting obituary notices of Mr. Ronald Hudson and Dr. Pirie. Among the contributors we

note the well known names of Dixon, Glaisher, Hilton, Hobson, Jackson, Lamb, Love, MacMahon, Morley, Volterra, Rayleigh, Young, and many other mathematicians. An attempt to classify the papers by subject-matter would be difficult, but a general survey of the ground covered suggests that a not inconsiderable proportion, possibly as much as a half, of the work done comes under the heading of "analysis."

But while the reputation of English mathematical research is thus being maintained, it does seem a pity that there is no society which has undertaken the task of popularising the higher study of mathematics in our country in the way that has been undoubtedly done on the other side of the water by the American Mathematical Society, with its *Bulletin* containing full reports of meetings of mathematical societies, educational appointments, and courses of university lectures. The Mathematical Association has done much to render elementary mathematics more practical and interesting. The duty of impressing on the proper authorities the need of providing more fully for instruction in *advanced* mathematics in our *technical* colleges has not as yet been undertaken by any body of mathematicians, yet the matter is an urgent one as affecting national progress in the face of foreign competition. In connection with most of the papers before us, an enormous amount of work is generally done in refereeing previous to publication. Is it not possible that the energy thus expended might with advantage be diverted into some such directions as those above indicated?

Catalogue of the Collection of Birds' Eggs in the British Museum (Natural History). Vol. iv., Carinatae (Passeriformes, continued). By E. W. Oates, assisted by Captain S. G. Reid. Pp. xviii + 350; 14 plates. (London, 1905.)

IN this volume the authors record the eggs of seventeen families of passerine birds contained in the national collection, thus carrying down the work to the family Certhiidae (creepers), so that another volume ought, apparently, to bring their task to a conclusion. The total number of species catalogued in the volume before us is 620, which are represented by no less than 14,917 eggs—figures which give some idea of the heavy work the authors had to undertake. Fortunately, the Radcliffe Saunders and the C. B. Rickett collections were received in time to allow their quota to be added to the MS.

We had hoped that as the work progressed the authors would have seen their way to modify the style of the paragraphs recording the distinctive features of the various species catalogued. We regret to see that this is not so, and with the same dreary and wearisome iteration we find entry after entry commencing with the statement that the eggs of such-and-such a bird are of such-and-such form and colour. As a matter of fact, if the English names of the various species had been printed in the same lines as their scientific titles there would have been no occasion to mention the word "eggs" at all in the descriptive paragraphs, which should commence merely with a reference to their form and colouring. By this means not only would much valuable space have been saved (as might also be done in the mode of making the entries themselves), but the reader would have been spared that everlasting and utterly superfluous repetition which is so irritating to any person of literary tastes. We may also direct attention to the crude and schoolboy-like style of composition characterising almost the whole of the paragraphs in question. Reference may likewise be made to some

imperfection in the method of recording localities. If, for instance, it is necessary to tell us on p. 16 that certain places are in the Nilgiri Hills, it was surely incumbent on the authors to give the same piece of information on p. 8, while to wait until p. 264 before stating that the Nilgiri Hills themselves are in southern India is a very remarkable proceeding. We are also surprised to learn (p. 162) that Dharmasala is in Kashmir.

The great feature of the volume is the beauty of the fourteen coloured plates of eggs, each containing a large number of figures, all of which have been drawn and coloured by Mr. H. Grönvold. These serve to illustrate very graphically the degree of constancy or variation which obtains in the egg-characters of the different family groups, and in addition to this show some very remarkable examples of individual variation or "sports."

Leather for Libraries. By E. Wyndham Hulme, J. Gordon Parker, A. Seymour-Jones, Cyril Davenport, and F. J. Williamson. Pp. 57. (London: Published for the Sound Leather Committee of the Library Association by the Library Supply Co., 1905.) Price 1s. 6d.

THIS interesting book, which may have a considerable influence on the improvement of book-binding, consists of five chapters, one by each of the authors whose names are on the title-page, three of whom are members of the Sound Leather Committee of the Library Association, and may therefore be considered as authorities on the subjects of which they write.

When light leather is tanned by bark and many other vegetable tanning substances the skin becomes coloured, and this colour cannot be removed without deterioration of the leather. In 1565 sumach tanning was introduced into England; this process leaves the skin white and in a suitable condition to receive the necessary dye. Experiments conducted by the Society of Arts Committee have shown that sumach tanning is the most suitable for binding leathers. Unfortunately this process is a slow one, and other tanning materials which act more rapidly have been employed; some of these, however, have a deleterious action on the leather, causing it to decay rapidly. Another cause of the short life of some modern leathers is the use of sulphuric acid at one stage of the process. This acid combines with the fibre and cannot be removed; it has a corrosive action on the organic matter, which action has often been attributed to the presence of sulphur in the coal gas used for lighting. In some libraries, however, which are not lighted by gas, the bindings have been found to perish in the course of a few years, and the presence of sulphuric acid in these leathers indicates the cause. Sulphuric acid is also used in connection with the aniline dyes frequently employed for colouring. Another source of weakness is the splitting of the leather in order to obtain smooth surfaces; this process necessarily cuts the network of fibres, and thus diminishes the strength of the material. The tanner should have regard to the sources of the skins, and if they are imported it is advisable to consider the treatment that they have undergone before coming into his hands.

It is impossible to do justice to this book in a short notice, but the attention that has recently been directed to the subject seems already to have borne fruit, for in the advertisements of leather-sellers and book-binders at the end of the book there are such notices as "dressed according to the recommendations of the Society of Arts Report" and "guaranteed free from mineral acids."

H. M.